

C-Series Display

New Features

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Important Information

Intended use

The C-Series display unit can be used in GPS-based or marine radar-based navigation systems on non-IMO/SOLAS class leisure vessels or small workboats.

This handbook tells you how to operate and maintain the C-Series display effectively.

For information on system integration and how to install the unit, refer to the C-Series Installation Guide supplied with the display.

Safety notices



WARNING: Navigation Aid

This device is intended to be used as an aid to navigation. Its accuracy can be affected by many factors, including equipment failure or defects, environmental conditions and incorrect handling or use. It is the user's responsibility to exercise common prudence and navigational judgement. This device should not be relied upon as a substitute for such prudence and judgement.



WARNING: Product installation

This equipment must be installed in accordance with the instructions in the C-Series System Installation Guide. Failure to do so could result in poor product performance, personal injury and/or damage to the vessel.



WARNING: High voltage

The display unit and scanner unit contain high voltages. Adjustments require specialized service procedures and tools only available to qualified service technicians - there are no user serviceable parts or adjustments. The operator should never remove the display unit cover or attempt to service the equipment.



WARNING: Electromagnetic energy

The radar scanner transmits electromagnetic energy. Ensure that the scanner has been installed according to the recommendations given in the relevant scanner handbook. Avoid looking directly at the antenna.

**WARNING: Fishfinder sounder module**

Removing the transducer cable from the rear of the fishfinder sounder module whilst it is switched on can cause sparks. Only remove the transducer cable after power has been switched off. Ensure that the sounder module is mounted where it is well ventilated and in an area free from flammable vapors.

CAUTION: Water Ingress

To prevent the ingress of water and consequent damage to the display, ensure that the chart card door is firmly closed. This can be confirmed by an audible click.

CAUTION: CompactFlash Cards

- Removing the CompactFlash card whilst information is being written to or read from it may cause damage to the card and loss of all data. Use the proper procedure detailed on *page 18* to remove the card.
- Do not save data (waypoints, routes etc.) to a Navionics card as the charts may be overwritten. When archiving use a different CompactFlash card.
- DO NOT use a metallic instrument such as a screwdriver or pliers to help you remove a card, as doing this can cause irreparable damage.

CAUTION: Global Positioning System Antenna

Do not connect or disconnect the GPS antenna from the display unit whilst power is switched on. Doing this may result in irreparable damage.

CAUTION: UV Light

To provide protection against the damaging effects of UV light, it is advisable to replace the sun cover provided when the display is not in use.

CAUTION: Cleaning the display

Take care when cleaning the display, to avoid damaging it:

- (1) Do NOT wipe the display screen with a dry cloth, as this could scratch the screen coating.
- (2) Do NOT use acid, ammonia based or abrasive products.

Disclaimer

Electronic charts are an aid to navigation designed to facilitate the use of authorized government charts, not to replace them. Only official government charts and notices to mariners contain the current information needed for safe navigation. The Captain is responsible for their prudent use. The C-Series and its charts do not therefore exclude the user from carrying the required official charts and documents.

Raymarine does not warrant that this product is error-free or that it is compatible with products manufactured by any person or entity other than Raymarine.

This product uses digital chart data, bathymetric data, three-dimensional and photographic imagery, and electronic information from the Global Positioning System (GPS) which may contain errors. Raymarine does not warrant the accuracy of such information and you are advised that errors in such information may cause the product to malfunction. Raymarine is not responsible for damages or injuries caused by your use or inability to use the product, by the interaction of the product with products manufactured by others, or by errors in chart data or information utilized by the product and supplied by third parties.

About this manual

This manual describes how to operate your C-Series display in conjunction with Navionics cartography. It assumes that all peripheral equipment to be operated with it is compatible and has been correctly installed.

This manual is intended for users of varying marine abilities, but assumes a general level of knowledge of display use, nautical terminology and practices.

Technical accuracy

To the best of our knowledge, the technical information contained within this handbook was correct at the time of printing. However, Raymarine cannot accept liability for any inaccuracies or omissions it may contain.

Raymarine's policy of continuous product improvement may mean specifications change without notice. As a result, Raymarine cannot accept liability for any differences between the product and this handbook.

Raymarine does not support after-sales or technical support for Navionics chart cards. If you wish to file a report of an error or omission on a Navionics chart, please provide the information to the Navionics web site at the link below:

<http://www.navionics.com/DiscrepancyReports.asp>

Raymarine does not necessarily support all the features in particular Navionics cartography.

EMC conformance

All Raymarine equipment and accessories are designed to the best industry standards for use in the recreational marine environment. Their design and manufacture conforms to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised.

Multi-media chart cards

To use your C-Series Display as a navigation aid, you need charts with the appropriate level of detail for the geographic area you wish to navigate. The charts are available in electronic format on Navionics Chart cards.

To check the current availability of Navionics® chart card types and the latest feature sets, visit www.navionics.com or **www.navionics.it**.

To obtain Navionics cards, contact your local dealer or visit the Navionics web site.

Alternatively, from anywhere in North America call Navionics toll-free on **1-800-848-5896**. Outside of North America, contact your local dealer or Navionics SpA on:

Phone: (+39) 0584 961696 or Fax: (+39) 0584 961309)

When you archive data, use only SanDisk CF memory cards. Other brands of CF memory card may not work in your C-Series Display.

Disposal

Waste Electrical and Electronic Equipment (WEEE) Directive



The WEEE Directive requires the recycling of waste electrical and electronic equipment. Whilst the WEEE Directive does not apply to some of Raymarine's products, we support its requirements as part of our environmental policy and we ask you to be aware of how you should dispose of this product.

The crossed-out wheellie bin symbol found on a product signifies that it should not be disposed of in general waste or landfill.

Please contact your local dealer, national distributor or Raymarine Technical Services for information on product disposal.

Chapter 1: New Features of the C-Series Display Unit

This document describes features which have been added to the C-Series display unit since the C-Series Display Reference Manual (document number 81221-2) was written. All the content of that manual is still valid, and the features it covers still operate as described.

You can now listen to Sirius Audio satellite radio broadcasts, view tide and current animations, and make use of improved weather information. There is also autopilot integration and improved graphical display of data, including a compass bar.

This document tells you how to use the new functions and features.

For installation information, refer to the C-Series Display Installation Manual (document number 87020-2).

1.1 Navionics support

In addition to Gold and Platinum, the C-Series now supports the following Navionics cartography:

- Silver
- Gold Plus
- HotMaps USA
- HotMaps Premium
- Fish 'N Chip

For more information on Navionics charts, see www.navionics.com.

1.2 Chart application

A new Animate function shows tide and current data in animated sequences. You can control the way these sequences are played, including setting the date for the animation. The Chart application also now provides range rings.

1.3 Graphical data

You can now set the display unit to show a compass bar along the top of the screen, and configure it to display various engine data.

1.4 Autopilot control

If you have a Raymarine autopilot and pilot head installed, you can access some of its functions from the C-Series display.

Note: *The display unit **does not replace** the pilot head: never use autopilot functions without a pilot head installed.*

1.5 Weather (US only)

Note: *The following weather features require the SR50 Sirius Receiver and separate subscription.*

The weather application superimposes historical, live and forecasted weather graphics on a world map. It also provides textual forecasts and warnings. These graphics and their associated weather data enable you to determine the actual conditions in your vicinity or at a particular location. Weather forecasts and warnings, detailing current and predicted conditions, are regularly updated.

1.6 Sirius Audio (US only)

Note: *The following audio features require the SR50 Sirius Receiver and separate subscription.*

The C-Series can control a Sirius audio receiver, giving you access to satellite radio channels. You can also make use of features including preset channels, channel scan, favourite song alerts, and parental locking.

Chapter 2: Chart Application Updates

Updates to the Chart application allow you to view tide and current animations for a 24-hour period, set the display unit to overlay range rings on the chart view, and show bathymetric data included on Navionics combined data cards.

This chapter tells you how to make use of the new Chart application features.

WARNING: Electronic charts are an aid to navigation designed to facilitate the use of authorized government charts, not to replace them. Only official government charts and notices to mariners contain the current information needed for safe navigation. The captain of the vessel is responsible for their prudent use. The C-Series and its charts do not exclude the user from carrying the required official charts and documents.

2.1 Animated tides and currents

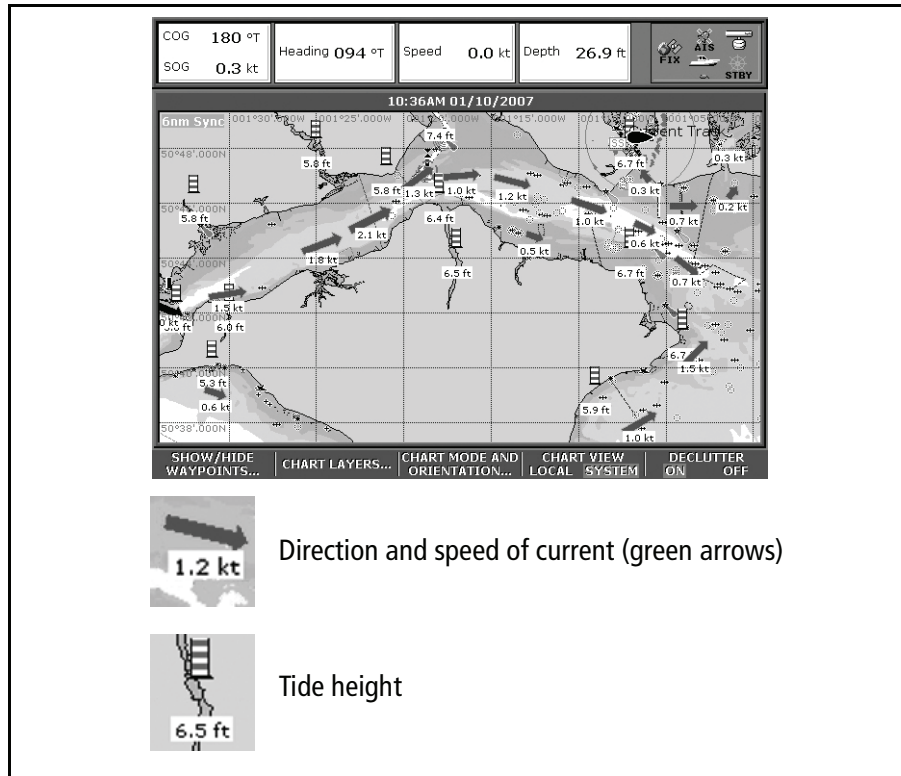
You can set the date for the animation and choose to see the whole animation from the beginning or start it at any point within the 24-hour period. You can also choose to view the animation continuously or to step through it in increments of time you set.

To view tide and current animations

In the Chart application:

1. Highlight a tide or current icon.
2. Press **OK** to open the Object Info dialog box and toolbar.
3. Press the **ANIMATE...** softkey.

The Tide/Current Animation screen opens with animation paused.



Press the **ANIMATION PLAY/PAUSE** softkey to start animation.

Animation time and date are displayed on the status bar; the animation starts from the current time.

Controlling the animation

When you open the Tide/Current Animation screen, the toolbar provides softkeys to stop and start the animation; step the animation forwards or backwards in time; set the size of the step, or select a date for the animation.

The animation plays in a loop: when it reaches the end of a 24-hour animation period, it starts again at the beginning.

To start or stop the animation

On the Tide/Current Animation screen:

- Press the **ANIMATION PLAY/PAUSE** softkey.

To view the animation in steps

On the Tide/Current animation screen:

- Press either the **STEP BACK** or **STEP FWD** softkeys.

To set the step interval

The Set Time Interval softkey gives you control over the Step Forward and Step Back functions.

1. If the animation is playing, press **PAUSE**.
2. Press the **SET TIME INTERVAL** softkey.

This displays a slider with the current time interval shown. Use the rotary controller to adjust it (within the range of 15 to 120 minutes).

3. Press **OK** or **CANCEL** to save the new interval.

Note: *The animation must be paused for the Set Time Interval function to be available.*

To set the animation date

1. Press the **SET DATE** softkey.

This displays the Edit Date screen and toolbar.

Table 2-1: Animation Date Toolbar

TODAY'S DATE	Set the animation date to the current date.
PREV DATE	Set the animation date to 24-hours previous to current date.
NEXT DATE	Set the animation date to 24-hours ahead of current date.
EDIT DATE	Opens the Edit Date pop-up screen: use the trackpad or rotary controller to enter the date you want to see an animation for.

2. Press **OK** to save the new date and return to the Tide/Current Animation screen, which will update to display the tide or current for the date you chose.

Note: *Press **CANCEL** to ignore the date change and go back to the Tide/Current Animation screen, leaving the date setting unchanged.*

2.2 Range rings

Range rings give you an incremental representation of distance from your vessel to help you judge distances at a glance. The rings are always centred on your vessel, and the scale varies to suit your current zoom setting. Each ring is labelled with the distance from your vessel.

To turn range rings on or off

In the Chart application:

1. Press the **PRESENTATION** softkey.
2. Press the **CHART LAYERS** softkey.

3. Select **RANGE RINGS ON/OFF**.

2.3 Navionics combined data cards

Some Navionics data cards provide detailed bathymetric information in addition to standard chart information. You can choose between the standard chart view, or the view displaying bathymetric contours.

To display bathymetric information

In the Chart application:

1. Press the **PRESENTATION** softkey.
2. Press the **CHART LAYERS** softkey.
3. Press the **CHART TYPE** softkey to toggle between **FISH** and **NAV** options.
 - The **FISH** option displays bathymetric information.
 - The **NAV** option displays the standard chart view.

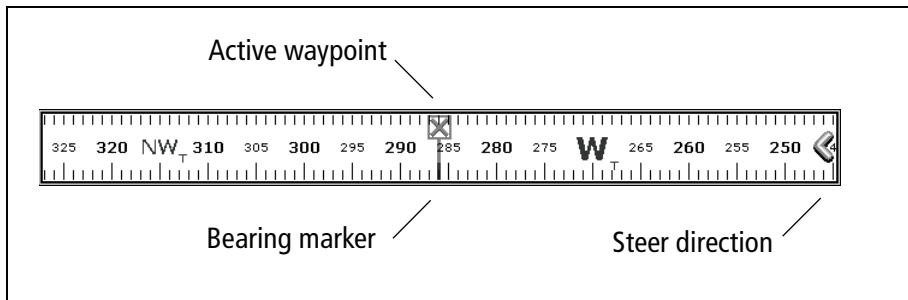
If you select **FISH** and no data is available for your current position, the databar displays (FISH) to indicate that you are in that mode but without data.

Chapter 3: Graphical Data

The C-Series now gives you the option to display some navigation and engine data graphically. You can configure the unit to display a compass bar, and to show additional engine and genset (engine-driven electricity generator) data.

3.1 Compass bar

The compass bar gives you a continuous readout centred on your current heading or course over ground (COG). Arrows at either end of the bar indicate current steer direction.



- In **heading** mode, the bearing marker is **RED**.
- In **COG** mode, the bearing marker is **GREEN**.
- When you use the compass bar with an **active waypoint**, the bearing marker is **BLUE** and the active waypoint symbol indicates the bearing to your waypoint.

Turning the compass bar on and off

You turn the compass bar on and off from the data toolbar.

- Press the **DATA** button.

Use the **DATABAR** softkey to turn the compass bar on or off.

Table 3-1: DATABAR Softkey Options

ON	Displays the standard databar, at the top or side of the screen depending on your setup options.
COMPASS	Replaces the standard databar with the compass bar, displayed along the top of the screen.
OFF	Removes both the databar and the compass bar from your display.

Note: *When the compass bar is displayed the transducer icons remain visible in the top-right section of the screen.*

Compass bar setup

The compass bar is set to open in heading mode. To change this setting, press the **MENU** button and go to the Databar Setup menu where you can select either Heading or COG.

Note: *If MOB is activated while the compass bar is open, the compass is replaced with the MOB toolbar. The compass bar returns when you cancel the active MOB.*

3.2 Graphical engine data

You can now display engine tilt and trim data, and data for up to four engine-driven electricity generators (gensets). You may need to set up a new page (or modify an existing page set) for this data as an engine application window is not included in the preconfigured page sets.

To set up an engine data page

1. Press and hold the **PAGE** button.
2. Select the page set you want to edit by pressing its corresponding softkey.
3. Highlight your preferred page layout and press **OK**.
4. In the application list, highlight **engine** and press **OK**.

Refer to the C-Series Reference Manual for more details on setting up page sets.

Engine tilt and trim

To display engine tilt or trim data:

1. Press the **MENU** button to open the Setup screen.
2. Select Panel Setup Menu.
3. Select a configuration.
4. Press the **SELECT DATA...** softkey.
5. In the Data Groups window, select **Engine**.
6. Select **Engine Tilt** or **Trim Tabs**.

Genset data

To display genset data:

1. Press the **SELECT DATA...** softkey.
2. In the Data Groups window, select **Genset**.

For a list of the data you can display for each genset, see *Table 3-2, Genset Data Options*.

Table 3-2: Genset Data Options

Data	Data type	Data range
Speed	Numeric or gauge	—
Total hours	Numeric	—
Coolant temperature	Numeric or gauge with numbers	0–150°C 0–300°F
Fuel temperature	Numeric or gauge	0–150°C 0–300°F
Oil pressure	Numeric or gauge with numbers	0–100 PSI 0–7 bar 0–750 KPa
Fuel rate	Numeric	—
Battery voltage	Numeric or gauge with numbers	8–24V
Average line voltage	Numeric or gauge with numbers	8–24V
Average AC frequency	Numeric	—
Status	Text	—
Load	Numeric or gauge	0–100%

To change the number of gensets

The default number of gensets is one. You can configure the unit to display data for up to four gensets:

1. Press the **MENU** button.
2. Select **Panel Setup Menu...**
3. Select **Number of Gensets**.

Chapter 4: Autopilot Control

If you have a Raymarine autopilot installed, you can access some of its functions from the C-Series display unit.

WARNING: The autopilot functions available on the C-Series display unit do not replace the autopilot control head. You must have a pilot control head installed before you enable or engage the autopilot.

Emergency disengage

You can disable the autopilot using the power key.

1. Press and release the **power** button.
2. Press the **STANDBY** softkey.

This puts the autopilot into standby mode.

4.1 Enabling and engaging the autopilot

To allow the C-Series to control autopilot functions, you need to enable autopilot control on the display unit.

With autopilot control enabled, the unit lets you engage the autopilot whenever it has a target waypoint. You can see information for the target waypoint on the Pilot Control pop-up.

The default autopilot setting is *disabled*.

To enable autopilot control

On the C-Series display:

1. Press the **MENU** button to open the Setup Menu.
2. Select **System Setup > System Integration > Autopilot Control > Enabled**.
3. Press the **OK** button.

To engage the autopilot in normal operation

When the autopilot is enabled, the unit prompts you to engage the autopilot whenever you initiate a GOTO or FOLLOW ROUTE.

1. Select **GOTO** or **FOLLOW ROUTE** to display the Engage Pilot screen.
2. Select **ENGAGE PILOT** to display the Pilot Control screen.

If you press **OK** or **CANCEL** without engaging the autopilot, you go back to the navigation screen with the autopilot disengaged.

When the autopilot is engaged, or you hotspot an active route or waypoint, the toolbar gives you the following options:

Table 4-1: Active Navigation Toolbar

STOP GOTO/FOLLOW	Opens the Pilot Control screen. If the autopilot is in track mode, the route complete alarm sounds.
ADVANCE WAYPOINT	Opens the Pilot Control screen and provides the AUTO and TRACK softkeys. The screen stays open until you choose either AUTO or TRACK.

Note: *You can only perform individual advance waypoint operations: it is not possible to perform one track command for multiple advance waypoints.*

To engage the autopilot from the Setup Menu

At any time, you can open the Pilot Control screen from the Setup menu:

1. Press **MENU**.
2. On the Setup Menu, select **Autopilot Control**.
3. Press the **ENGAGE PILOT -TRACK-** softkey.

Press **OK** or **CANCEL** to go back to the previous screen.

To disengage the autopilot in normal operation

You can disengage the autopilot from the Pilot Control screen.

1. Press the **STANDBY** softkey.

Emergency disengage

Alternatively, if the Pilot Control screen is not displayed, you can disable the autopilot using the power key.






1. Press and release the **power** button.
2. Press the **STANDBY** softkey.

This puts the autopilot into standby mode.

Autopilot Status Indicator

An indicator in the top-right corner of the display unit tells you the current status of the autopilot.

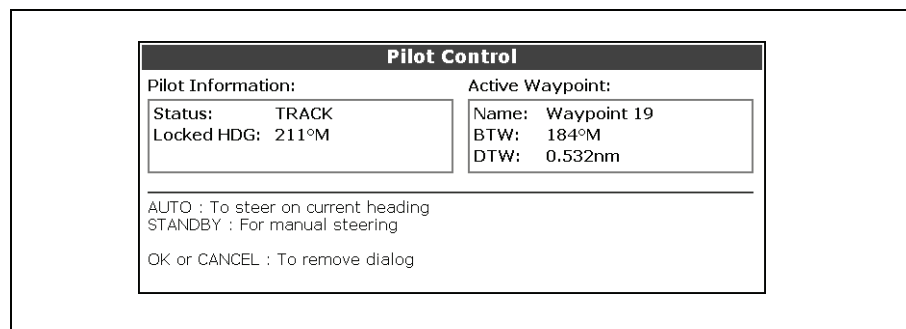
Table 4-2: Autopilot status indicators

Icon	Autopilot mode
	Standby.
	Track.
	Auto.
	No autopilot detected.
	Autopilot alarm is active.

4.2 The autopilot control screen

The Pilot Control pop-up screen is displayed when you engage the autopilot in track mode, at waypoint arrival, or when you select it from the Setup Menu. It gives you:

- Autopilot status
- Live navigation information
- Toolbar with softkeys to control the autopilot



For a list of the softkeys available while the Autopilot Control screen is open, see *Table 4-3, Autopilot Control Toolbar*.

Table 4-3: Autopilot Control Toolbar

AUTO	Engage the autopilot and hold the current course (available when the autopilot is in Track or Standby mode).
ENGAGE PILOT -TRACK-	Track to the current target waypoint.
STANDBY	Disengages the autopilot (only available when the autopilot is engaged).

To go back to the Active Navigation screen without activating AUTO or TRACK, press **OK** or **CANCEL**.

Note: *The STANDBY key replaces the REVIEW AND EDIT THIS ROUTE key.*

4.3 Waypoint arrival

...when there are more waypoints in your route

The C-Series display:

- sounds the waypoint arrival alarm
- displays the Pilot Control screen, with information about the next waypoint

The toolbar gives you four options:

Press the **ENGAGE PILOT -TRACK-** softkey to engage the autopilot and continue to the next waypoint in your route.

Press the **CLEAR ALARM** softkey to silence the alarm and keep the autopilot engaged in auto mode, continuing on the current heading.

Press the **STANDBY** softkey to cancel the alarm and disengage the autopilot.

Press the **AUTO** softkey to cancel the alarm and engage the autopilot in auto mode.

Note: *If you make no selection within 30 seconds, the Next Waypoint alarm will sound.*

...when you reach the last waypoint in your route

The C-Series display:

- sounds the waypoint arrival alarm
- displays the Pilot Control screen with 'Last Waypoint' in the Next Waypoint field.

The toolbar gives you three options:

Press **CLEAR ALARM** to silence the alarm and keep the autopilot engaged in auto mode, continuing on the current heading.

Press **STANDBY** to silence the alarm and disengage the autopilot.

Press **AUTO** to silence the alarm and continue on the current locked heading with autopilot engaged.

Chapter 5: Weather (US only)

This application is only available for the United States if you have an SR50 Sirius Receiver installed and separate subscription to the weather service. You can get weather information for the rest of the world via a Navtex receiver. See the C-Series Reference Manual for more information.

5.1 Overview

The weather application superimposes historical, live and forecasted weather graphics on a world map. It also provides textual forecasts and warnings. These graphics and their associated weather data enable you to determine the actual conditions in your vicinity or at a particular location. Weather forecasts and warnings, detailing current and predicted conditions, are regularly updated.

For a basic weather glossary, please refer to the appendix at the rear of this manual. For types of warnings, watches and advisories, refer to the NOAA website at www.nws.noaa.gov

5.2 Disclaimer

The following caution is displayed on the C-Series unit each time you power it on if weather data is being received.

CAUTION: ADVISORY ONLY

The weather information is subject to service interruptions and may contain errors or inaccuracies and consequently should not be relied upon exclusively. You are urged to check alternate weather information sources prior to making safety related decisions. You acknowledge and agree that you shall be solely responsible for use of the information and all decisions taken with respect thereto. By using this service, you release and waive any claims against Raymarine, Sirius Satellite Radio Inc., WSI, and Navcast Incorporated with regard to this service.

5.3 Setting up the weather application

Before you can use the weather application you need to:

- Obtain a Sirius ID number. (For full details, please refer to your Sirius Installation handbook.)
- Check the pre-requisites for using the application (see below).
- Customize a page set to include a weather application.
- Specify the weather elements that you wish to display.

Pre-requisites for using the weather application

For your C-Series to display weather data, the system must be connected to an SR50 Sirius Receiver which is supplying the appropriate data. For your vessel to be displayed and for weather reports to be available at your position, you need a fix for your boat's position and be within US coastal waters.

Note: For further information on installing and commissioning a weather receiver, refer to the *SR50 Weather Receiver Installation Guide*.

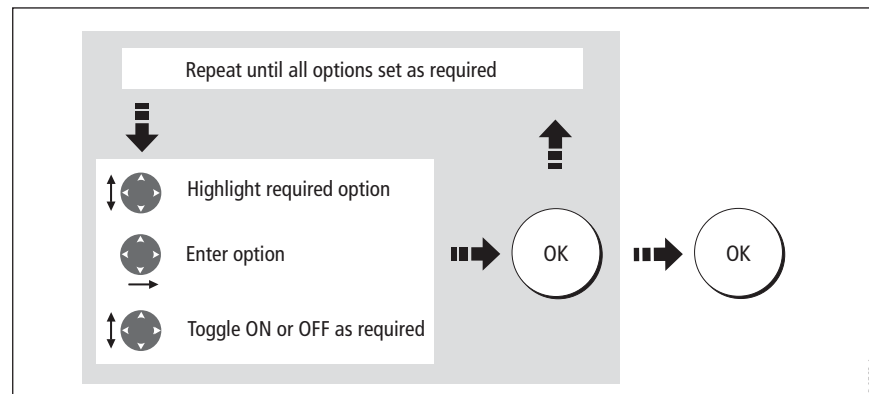
Adding a weather application

A weather application window is not included in the pre-configured page sets. You therefore need to customize a page set to include one. Refer to the C-Series Reference Manual for details.

Specifying the weather elements displayed

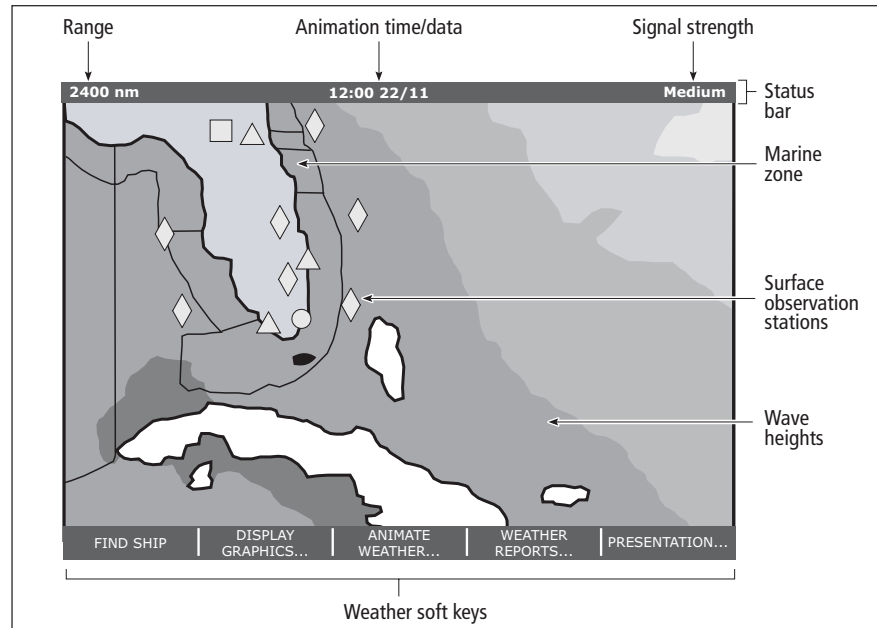
You can view textual reports or animated graphics and specify the weather elements that you require:

1. Open a weather application window.
2. Press the **DISPLAY GRAPHICS** softkey.
3. Select the weather elements to display:



5.4 The weather display

The main features of the weather display are as follows:



5.5 Moving around the weather map

When you open the Weather application, a world map is displayed. Use the cursor to move around the map and the range button to zoom in and out. For further details, see the C-Series Reference Manual.

Note: *As resolution in the data is lost when you zoom out a long way, zoom in to display more detail.*

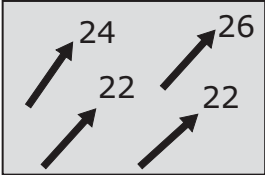

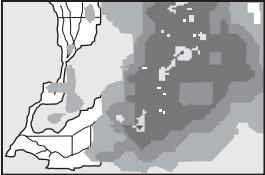
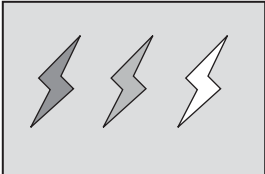
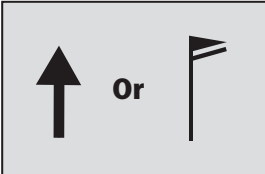

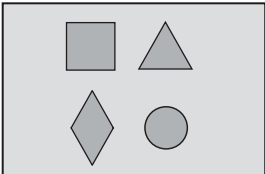
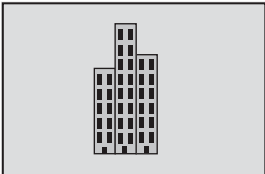







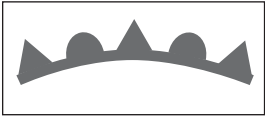

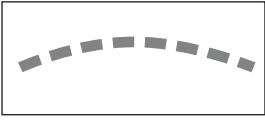
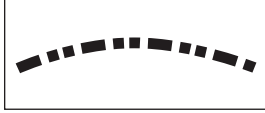
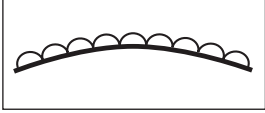
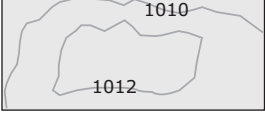
To re-centre the map on your boat, use the **FIND SHIP** soft key.

5.6 Placing waypoints

The waypoint button and its associated soft keys operate as normal when you are in the weather application but you will need to move the active window to a radar or chart application in order to see any waypoints that you have placed.

5.7 Weather graphics

This section summarizes the weather symbols used within the weather application. For details of each weather type, please refer to the appropriate section.

Weather symbols		
		
Storm cast	Waves (blues)	Canadian radar (Dark greens-yellow)
		
Lightning	Wind	Sea surface temperature (green-yellow-orange)
		
Surface observation stations (pink)	Cities (grey)	NOWRad (green-yellow-red) Snow (Blues), Mixture (Pinks)
Storm Tracks symbols		
		
Hurricane (Category 1-5)	Tropical storm	Tropical disturbance, tropical depression
Surface pressure		
		
High / low pressure (blue & red)	Warm front (red)	Cold front (blue)
		
Occluded front (purple)	Stationary front (red-blue)	Trough (brown)
		
Squall line (red)	Dry line (red)	Isobars (grey)

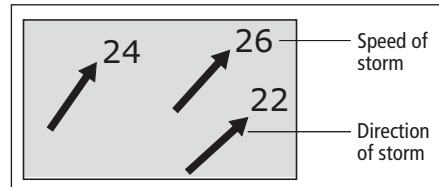
Precipitation (NOWRad)

NOWRad displays the type and level of precipitation:

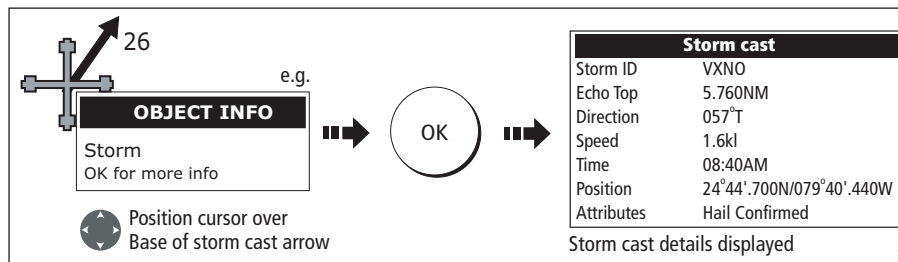
Color code	Precipitation type	Intensity
Light green	Rain	(15-19 dBz)
Medium green	Rain	(20-29 dBz)
Dark green	Rain	(30-39 dBz)
Yellow	Rain	(40-44 dBz)
Orange	Rain	(45-49 dBz)
Light red	Rain	(50-54 dBz)
Dark red	Rain	(55 + dBz)
Light Blue	Snow	(5-19 dBz)
Dark blue	Snow	(20 + dBz)
Light pink	Mixed	(5-19 dBz)
Dark pink	Mixed	(20 + dBz)

Storm Cast

Storm cast arrows indicate the direction and speed of a storm.



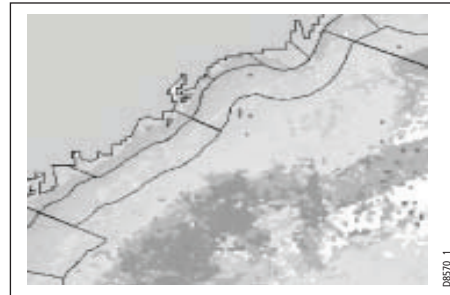
To display details of the storm:



Sea surface temperature (SST)

The temperature range of the sea surface is indicated by shading. This shading ranges through blue/green/yellow/orange/red.

For details of how to view the sea surface temperature at a specific point, see *page 26*.



Canadian radar

Canadian radar shows the intensity of precipitation for Canada. Unlike NOWRad, Canadian radar does not show the precipitation type.

Color code	Intensity in mm per hour
Transparent (nothing shown at very low precipitation)	0.00 to 0.20 mm/hr
Light green	0.21 to 1.00 mm/hr
Medium green	1.01 to 4.00 mm/hr
Dark green	4.01 to 12.00 mm/hr
Yellow	12.01 to 24.00 mm/hr
Orange	24.01 to 50.00 mm/hr
Light red	50.01 to 100 mm/hr
Dark red	100.01+ mm/hr

Tracking storms

You can use the STORM TRACK function to monitor significant storms in your area. These include tropical disturbances, depressions, storms and cyclones, hurricanes, typhoons and super typhoons.

The system displays the track the storm has taken, its current and forecasted position, the wind radii (current position only), direction and speed of travel.

Storm Tracks symbols

These symbols are displayed on screen in three different colours:
 Grey - historical, Red - current, Orange - forecast

Hurricane (Category 1-5)	Tropical storm	Tropical disturbance, tropical depression

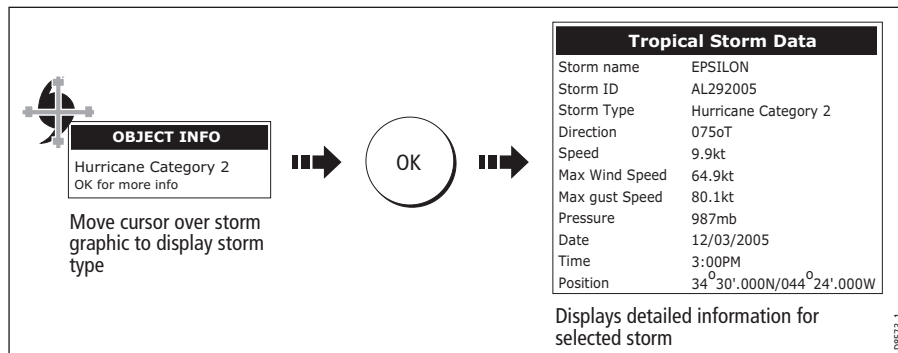
Move the cursor over the symbol for additional information.

Tropical storm data

Tropical storm data can be displayed for a selected storm. This includes:

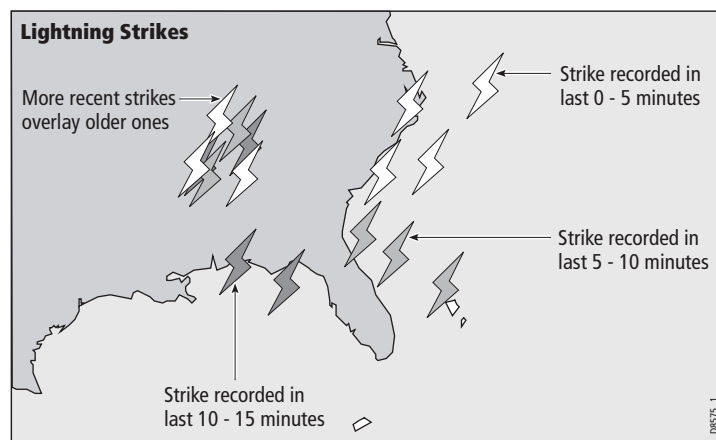
- The storm's name, type, date and time.
- The position, direction and speed of travel of the storm.
- The pressure and maximum wind speed and gusts.

To display tropical storm data:



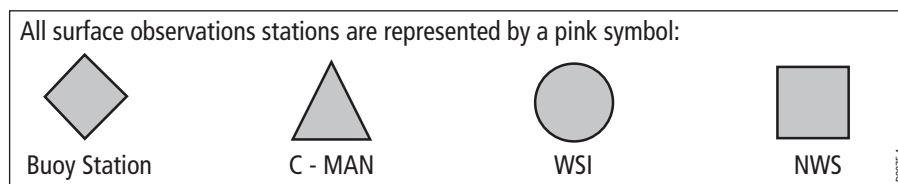
Lightning

The system displays a lightning symbol at each cloud-to-ground strike recorded within the last 5, 10 and 15 minutes:

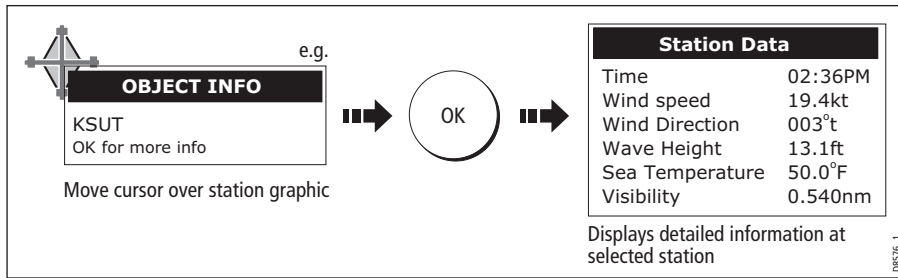


Surface observation stations

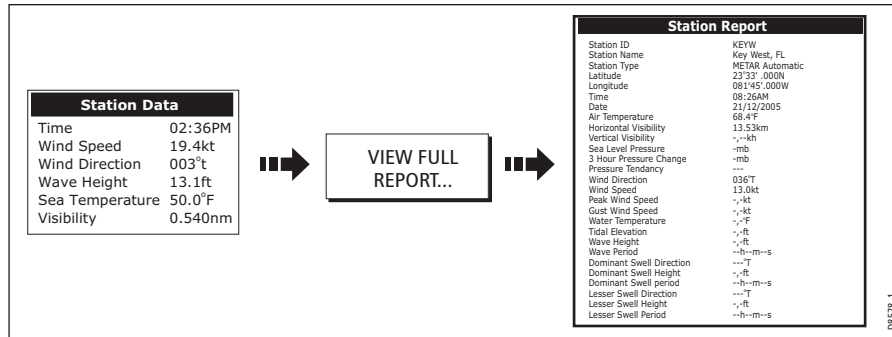
You can view current or historical weather data at surface observation stations.



To identify the station and display more associated weather data:



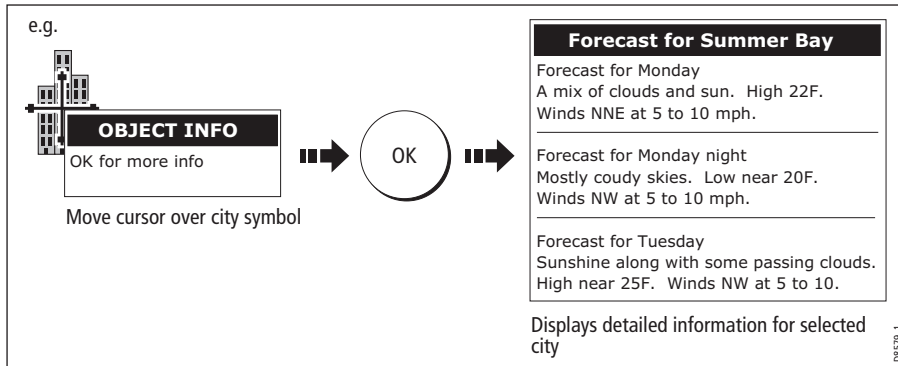
You can now select detailed live weather data for the selected observation station, if required:



Note: *Not all data is available for all stations.*

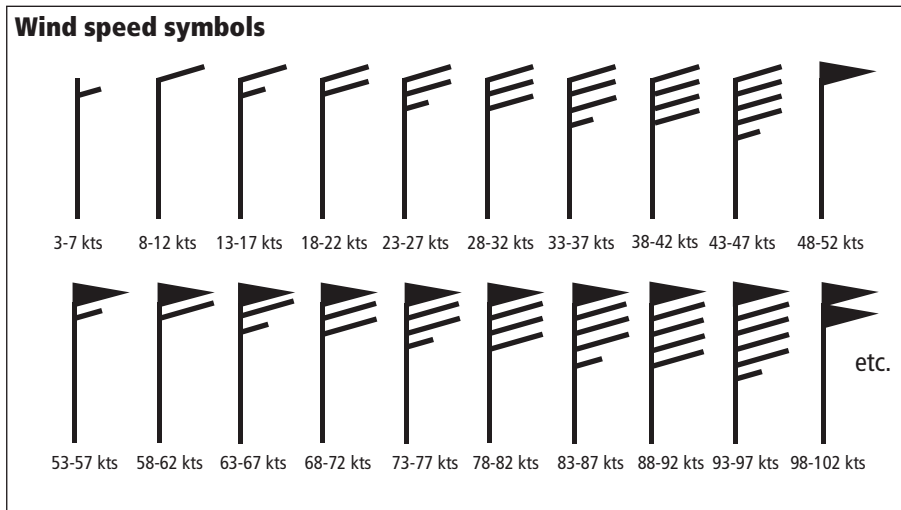
City forecasts

The Cities option gives you access to details of city weather forecasts. Up to three forecasts may be available:



Wind

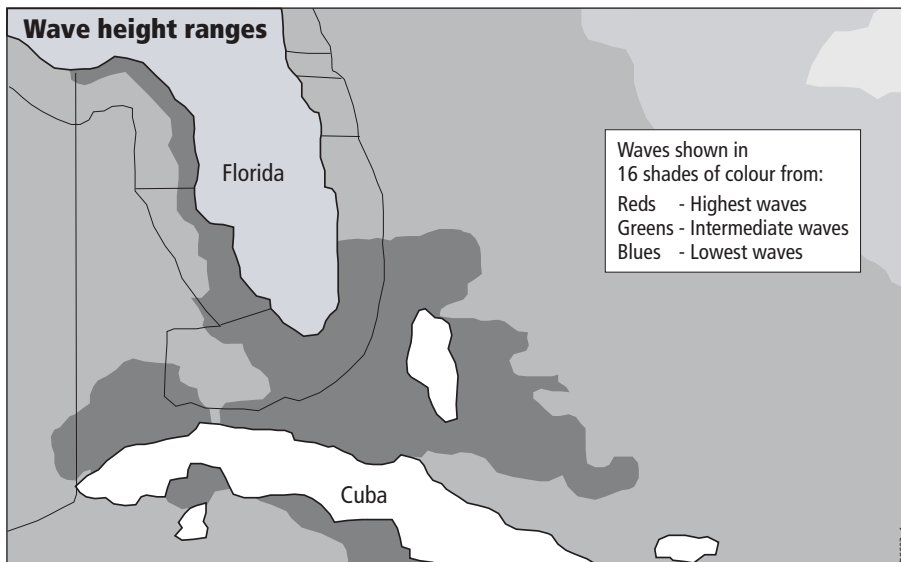
This option displays the current wind direction and magnitude. You can choose (via the Weather Setup Menu) to display the wind symbol as either an arrow or a wind barb. Wind arrows give an indication of wind speed - the larger the arrow the stronger the wind. Wind barbs give a more precise representation of wind speed:



- Notes:** (1) For details of how to view actual wind data at a specific point, see page 26.
 (2) For details of how to change the wind symbol, please refer to page 31.

Waves

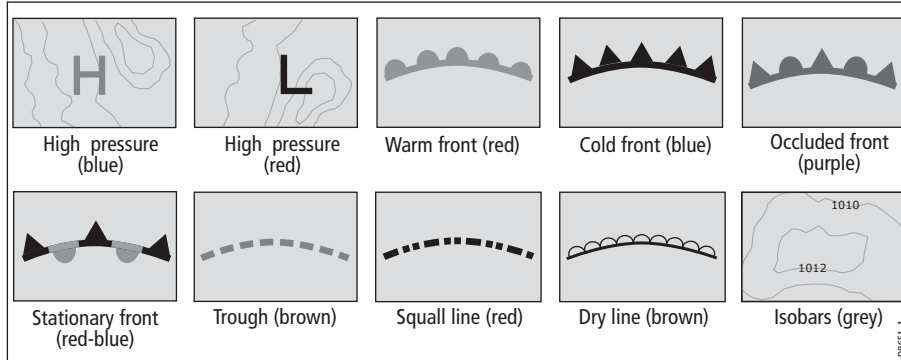
This option displays the current wave height in 16 levels e.g.



For details of how to view actual wave data at a specific point, see page 26.

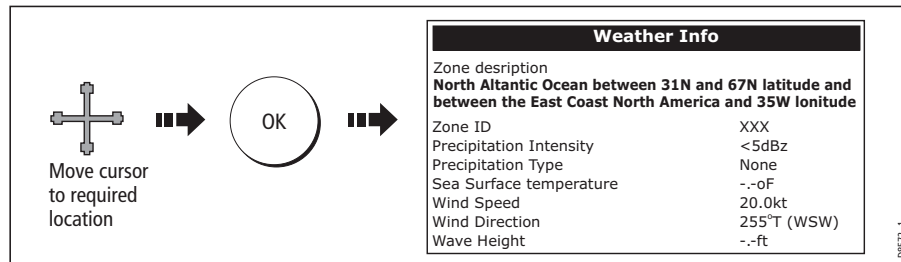
Surface pressure

This option shows surface pressure data using standard meteorological symbols:



Viewing data at a particular location

When required you can display the sea temperature, wind speed and direction, wave height, precipitation intensity and type for a particular location. This also shows the marine zone at the cursor position:



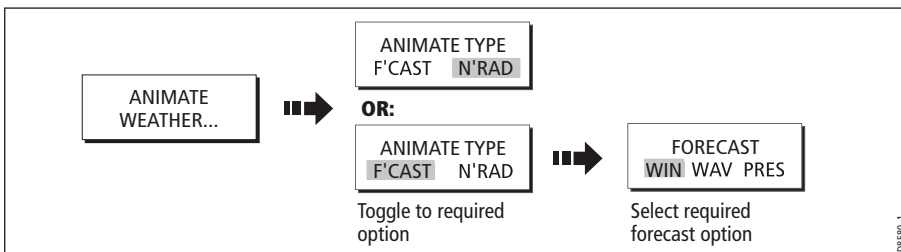
5.8 Animated weather graphics

The animated weather option allows you to view an animation from the current time for:

- The forecast for wind, wave or surface pressure.
- The weather radar history loop (NOWRad).

Setting up animation

To setup the animated weather graphic for forecasting (wind, wave or surface pressure) or for the weather radar history loop:



Running the animation

Once you have set the animation type (see previous section) you can run the animation feature:



The status bar indicates the time-frame displayed. The weather radar history provides up to eight images of data covering the last two hours, at 15-minute intervals.

If at any time you need to pause the animation, for instance to examine the displayed weather for a particular time frame, press PAUSE.

- Notes:** (1) *You cannot display information (by moving the cursor over a symbol) when animation is running. The range and trackpad controls do however remain operable provided the PAUSE option has not been selected. Ranging /panning will cause the animation to restart.*
- (2) *The animation will be switched to OFF, whenever the ACTIVE, PAGE, DATA, WPS/MOB, MENU are pressed or when the animation screen is closed and you return to the default weather screen.*

5.9 Viewing weather reports

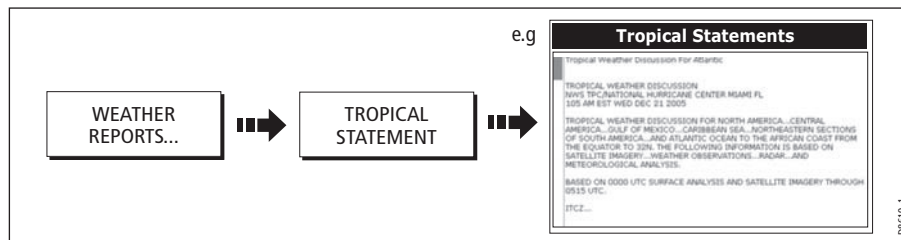
Your system will display reports for:

- Tropical statements.
- Marine warnings.
- Marine zone forecasts.
- Marine watchbox reports.

These weather reports are accessed via the WEATHER REPORTS soft key. Each report type may contain several bulletins; the window can be scrolled to view all the data.

Tropical statements

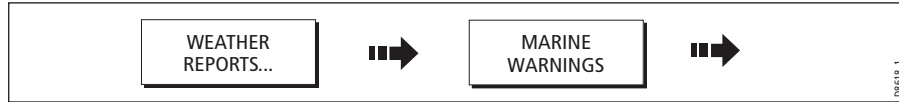
To display the reports for the latest tropical weather statements:



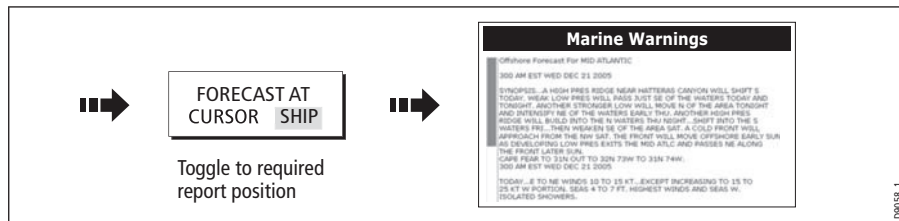
Marine warnings

To display a report for the current warnings (US coastal or near shore):

1. Select the MARINE WARNINGS option:



2. Display the marine warnings for the zone around your cursor or boat:



Marine zone forecasts

These forecasts cover:

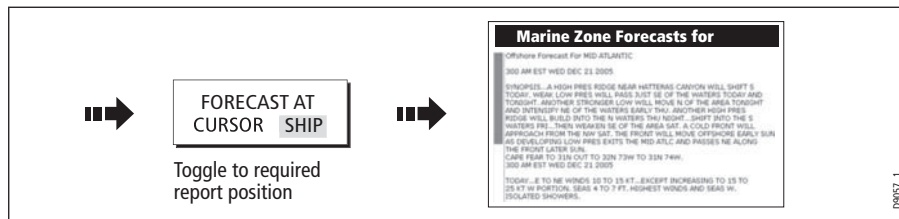
- US Coastal Weather Forecasts and Offshore Forecasts and High Seas Forecast, or
- Great Lakes Forecast and Near Shore Forecast, or
- Canadian Coastal Weather Forecast.

To display marine zone forecasts:

1. Select the MARINE ZONE FORECASTS option:

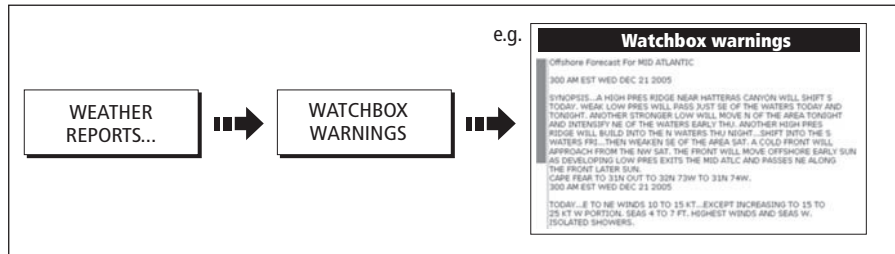


2. Display the marine zone forecasts for the area around your cursor or boat:



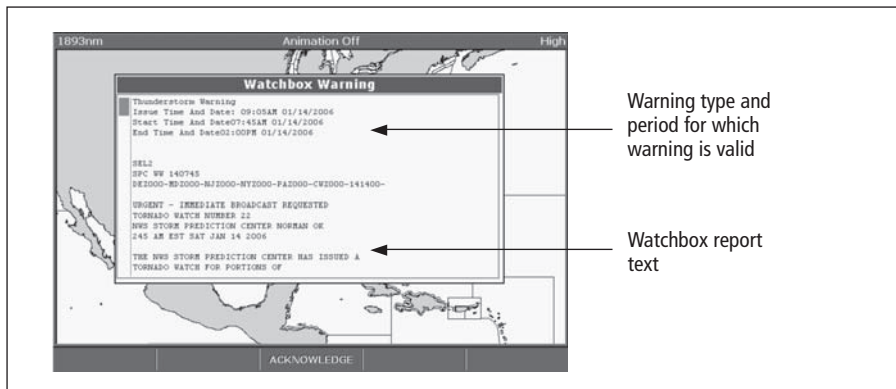
5.10 Watchbox warnings

To display available watchbox warnings:



Watchbox warning alerts

When a tornado or thunderstorm warning is received, the system will generate a watchbox alert:



Use the trackpad or rotary control to scroll through the report as necessary.

You can set the range for how close to your current position the watchbox must be to trigger the watchbox alert. The range can be set to OFF; 50; 150; 300; 500 and ALL. Units vary according to the configuration of your system.

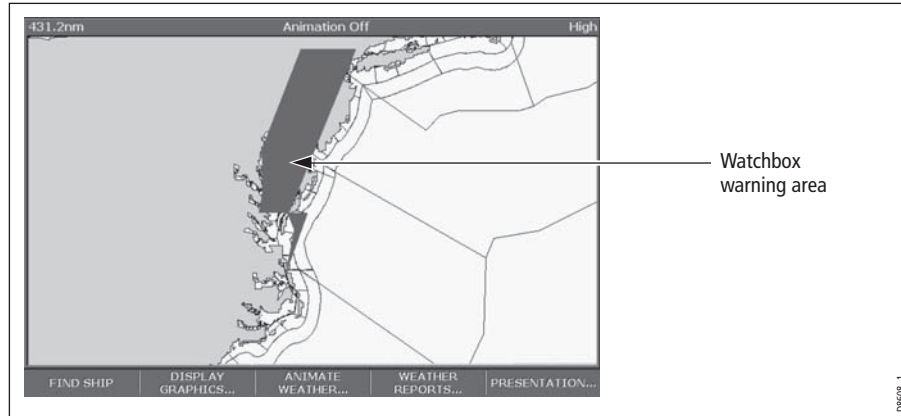
Clearing the alert

To clear an alert, press ACKNOWLEDGE. The alert is removed from the display. The watchbox warning can still be viewed via the Weather Reports soft keys

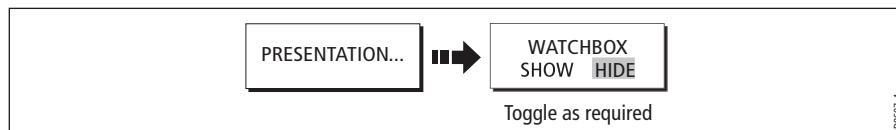
Note: *If required, you can switch off the marine watchbox alarm (via the Weather Setup Menu see page 31) or set the watchbox status to hide. Reports continue to be added to and/or updated in the database irrespective of the status that you have the alarm or show/hide feature set to.*

Displaying marine watchboxes

When the marine watchboxes feature is set to ON (default), any regions for which a watchbox is valid are highlighted on the weather map as a red polygon.



To show/hide watchboxes:



Displaying watchbox data

To display the data relating to a particular watchbox:

1. Position the cursor over the watchbox.
2. Press **OK** to display the Object Info pop-up screen.
3. Press **OK** again to display the watchbox data.

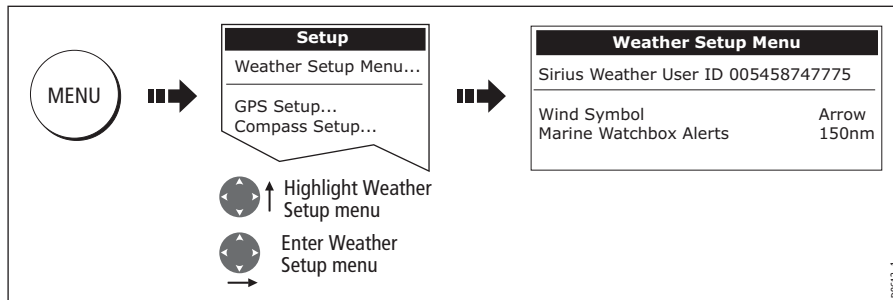
5.11 Weather application setup

When a weather application is the active window, the set up for your weather application can be changed from the standard configuration to suit your particular needs. Although you will probably only do this when you first use this application, you may decide to make subsequent adjustments once you become more familiar with the system. Any settings that you change are retained even when you power off.

The Weather Setup Menu also provides the User ID for your weather receiver.

Selecting the Weather Setup Menu

To select the Weather Setup Menu:

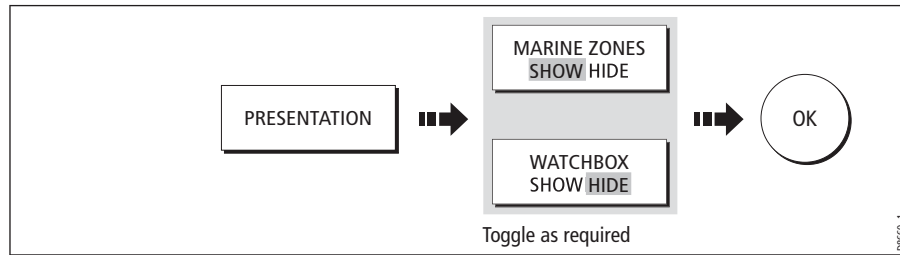


Weather Setup options

FUNCTION Description	OPTION (Defaults in bold)
Sirius Weather User ID Details the Weather ID obtained from Sirius and keyed in on your display.	(as advised)
Wind Symbol Graphic used for wind symbol	Arrow Barb
Marine Watchbox Alerts Enables alert when watchbox is issued.	OFF 50nm 150nm 300nm 500nm ALL

Showing/hiding marine watchboxes and zone boundaries

By default, the weather application displays marine zone boundaries and marine watchboxes. If required, you can hide these options:



5.12 Troubleshooting

Problem	Reason
Boat symbol not displayed	No position fix
FIND SHIP soft key greyed-out	No position fix
Boat symbol drawn as a solid circle	No heading or COG available
'No Connection' message is displayed in the status bar	No signal received from SR50; check cabling and that SR50 is powered.

Chapter 6: Sirius Audio (US only)

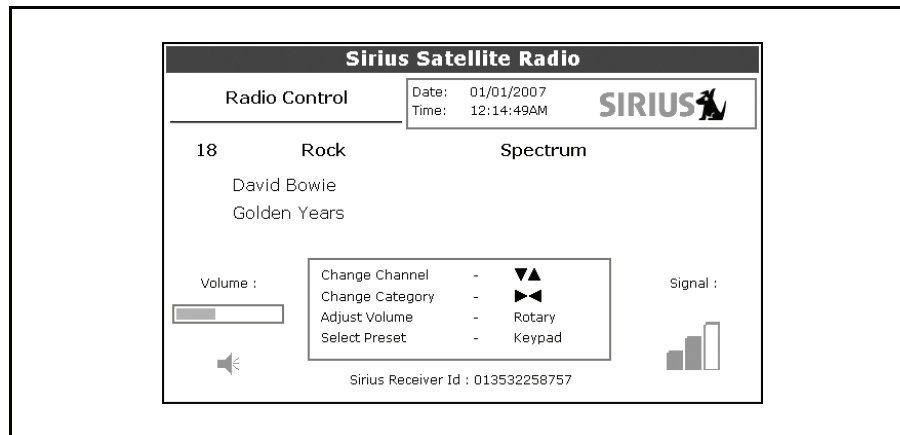
If you have a Sirius data receiver installed, you can use the C-Series display unit to control satellite radio broadcasts. Refer to the SR50 documentation for installation information.

The C-Series gives you access to basic and advanced audio functions. As well as listening to radio broadcasts and browsing or scanning channels, you can set up parental locks to limit access to selected channels and alerts to tell you when a favourite song is being played.

6.1 To start using Sirius Radio

1. Press **MENU**.
2. On the Setup Menu, select **Sirius Satellite Radio**.

The Sirius Radio Control screen opens:



Information contained on the Sirius Radio Control screen includes:

- Current channel name, number and category
- Play data for the current channel
- Date and time
- Receiver ID and signal strength

Use the softkeys and trackpad to control audio functions. Use the rotary controller to adjust volume.

The softkeys give you access to the functions outlined in *Table 6-1, Sirius Audio Toolbar*.

Table 6-1: Sirius Audio Toolbar

MUTE ON/OFF	Controls the mute setting.
PRESETS...	Displays a list of preset channels and the full channel list with modify options. Use the trackpad or rotary controller to scroll through the list of presets.
SETUP CHANNELS...	Gives access to the Edit Presets, Edit Alerts, Edit Channel Access, Scan Channels softkeys.
ALERTS...	Lets you set up an alert to tell you when favourite songs or artists are played on any channel.
BROWSE...	Scroll to view play data and to select channels, presets, or categories.

6.2 Tuning to a channel

From the Sirius Control screen, you tune to channels using the trackpad on the C-Series Display (or you can enter preset numbers directly using the alphanumeric keypad if you have one).

Trackpad up	Next channel.
Trackpad down	Previous channel.
Trackpad left	First channel in the previous category.
Trackpad right	First channel in the next category.

6.3 Browsing channels

The browse function allows you to view play data for channels without tuning to them.

To browse channels

1. On the Sirius Audio Control screen, press the **BROWSE** softkey.
Pressing this key displays the Channel List or Preset List for browsing. Toggle between the two lists with the **VIEW ALL/PRE** softkey.
2. Use the rotary controller or trackpad to scroll through the channels.
3. Press the **TUNE TO CHANNEL** softkey (or the rotary controller) to listen to the selected channel.

To go back to the Sirius Control screen, press **OK** or **CANCEL**.

Filtering categories from the browse

This feature allows you to choose a category from which to browse channels; other categories are excluded from the browse.

To filter categories

1. On the Browse screen, press the **FILTER BY** softkey.
2. Press the **SELECT CATEGORY** softkey.
3. Using the trackpad or rotary controller, select the category you want to browse.
4. Press **OK**.

6.4 Scanning channels

The Scan function automatically tunes to all channels in turn.

To scan channels

On the Sirius Radio Control screen:

1. Press the **SETUP CHANNELS...** softkey.
2. Select **SCAN CHANNELS**.
3. Use the **SCAN ALL/PRE** softkey to choose to scan all channels or only preset channels.
4. Press **SELECT** to stop the scan and listen to the active channel.

6.5 Hiding or showing channels and categories

You can select particular channels and categories to be excluded (hidden) from the Browse and Scan sequences.

To hide or show a channel or category

On the Sirius Radio Control screen:

1. Press the **SETUP CHANNELS...** softkey.
2. Select **EDIT CHANNEL ACCESS**.
3. In the channel list, select the channel you want to hide. If you want to hide a category, select any channel in that category.
4. Toggle between hidden and shown states with either the **CHANNEL SHOWN/HIDDEN** or **CATEGORY SHOWN/HIDDEN** softkeys.

6.6 Presets

You can assign up to 18 channels to presets to make tuning, scanning and browsing easier. To assign a channel to a preset, use the **PRESETS** softkey from the main control screen or the **EDIT PRESETS** softkey from any of the following screens:

- Setup channels
- Browse channels

At the Edit Preset Channels screen you can select a preset and assign a channel to it, move the assigned channel to a different preset, or delete the assigned channel.

Toggle between the Preset Channels list and the Channel List either by using the trackpad (left/right) or by pressing the appropriate softkey.

To assign a channel to a preset

1. Select an unused preset number from the Preset List.
2. Press the **ASSIGN NEW CHANNEL** softkey.
3. Select the target channel from the Channel List.
4. Press the **ASSIGN TO PRESET** softkey.

Note: *If the preset you want to use already has a channel assigned to it, delete the preset first.*

To delete a channel from a preset

1. In the Preset Channels list, select the preset you want to clear.
2. Press the **DELETE CHANNEL** softkey.

To move a channel to a new preset

1. Use the rotary controller or trackpad to select the preset you want to move.
2. Press **MOVE TO NEW PRESET**.
3. Scroll to the preset you want to move the channel to.
4. Press **MOVE TO NEW PRESET**.

Note: *You can overwrite a channel that has already been assigned to a preset, but you will be prompted to confirm the action.*

6.7 Parental locking

You can set up blocks on certain channels so that they can only be played if a correct password is entered. Parental locking must be enabled for the blocks on your selected channels to be effective.

By default, blocking is not enabled.

To enable blocking

On the Sirius Radio Control screen:

1. Press the **SETUP CHANNELS** softkey.
2. Press the **PARENTAL LOCK ON/OFF** softkey so that **ON** is highlighted.

To set up a password

On the Sirius Radio Control screen:

1. Press the **SETUP CHANNELS** softkey.
2. Press the **PARENTAL LOCK** softkey to highlight **ON**.
3. At the Password Setup screen, enter and confirm your password and hint.
Use the rotary controller (or trackpad) to select characters and press the rotary controller to accept them. Press **OK** to enter each field.

You can also access the password entry screen by pressing **EDIT CHANNEL ACCESS** then **CHANNEL ENABLED/LOCKED**.

To change an existing password

1. Press the **EDIT CHANNEL ACCESS** softkey.
2. Press the **EDIT LOCKOUT PASSWORD** softkey.
3. Enter your old password, then the new password and hint.

To block a channel

On the Sirius Radio Control screen:

1. Press the **SETUP CHANNELS** softkey.
2. Press the **EDIT CHANNEL ACCESS** softkey.
3. In the Channel List, select the channel you want to block.
4. Press the **CHANNEL ENABLED/LOCKED** to highlight **LOCKED**.
5. Repeat steps 3-4 for each additional channel you want to block.
6. When you blocked all the channels you want, press the **CLEAR** key.
7. Ensure the parental lock is on (**ON** is highlighted on the **PARENTAL LOCK ON/OFF** softkey).
8. At the prompt, enter your password.

Blocked channels remain visible in channel lists, but you cannot select them with the trackpad and they are ignored by the scan function. They are marked as locked by an icon next to the channel name.

To enter a password

If you select a blocked channel from the channel list or want to block a channel when the parental lock is on, you will be asked to enter the password.

1. Use the rotary control or trackpad to enter the password in the entry field.
2. Press **OK** to enter password.

After three incorrect attempts, the system displays your password hint.

6.8 Favourite song alerts

The favourites feature lets you set the C-Series to alert you when a favourite song or artist is playing on any channel. You can define up to 10 favourites using the Alerts softkey.

To enable favourite alerts

On the Sirius Radio Control screen:

1. Press the **ALERTS...** softkey to open the Edit Alerts screen.
2. Use the **ALERTS ON/OFF** softkey to toggle favourite alerts on and off.

To set up a song or artist alert

Press the **ALERTS** softkey to open the Edit Alerts screen. This screen shows ten favourites and the song playing currently.

You can delete a favourite from the list, add the current song or artist to the list or switch the favourites alert off.

1. Use the trackpad or rotary controller to select a favourite from the list.
2. If necessary, press **DELETE** to remove a favourite from the list.
3. Press **ADD SONG** or **ADD ARTIST** to assign the song or artist playing to the selected favourite.

If a song or artist is already assigned to the Favourite selected, you will be prompted to overwrite the existing favourite or cancel.

You can also mark a channel or song as a favourite by pressing the **ASSIGN TO ALERT** softkey while scanning.

When alerts are on and the system detects one of your favourites being played on any channel, it will display an alert and sound the alarm.

- To tune to the channel playing the song, press **TUNE TO CHANNEL**. To ignore the alert, press **CLEAR ALERT**.

Appendix A: List of Abbreviations

AIS	Automatic Identification System	km	Kilometer
ALR	Alarm	kpa	Kilo pascals
°C	Degrees Centigrade	KPH	Kilometers per hour
°F	Degrees Fahrenheit	kt	Knots
amp	Amperes	ky	Kiloyards
Auto	Automatic	l	litres
CAT	Category	Lat	Latitude
CCFL	Cold Cathode Fluorescent Lamp	Lon	Longitude
CDI	Course Deviation Indicator	m	Metres
COG	Course Over Ground	Man	Manual
C-Up	Course up orientation	MARPA	Mini Automatic Radar Plotting
CPA	Closest Point of Approach	MMSI	Maritime Mobile Service Identity
DC	Direct Current	MOB	Man Overboard
DSC	Digital Selective Calling	MPH	Miles per hour
DSM	Digital Sounder Module	nm	Nautical Mile
EBL	Electronic Bearing Line	NMEA	Nat. Marine Electronics Association
EMC	Electromagnetic Compatibility	N-Up	North up orientation
ETA	Estimated time of arrival	OSH	Automatic offshore mode
fa	Fathoms	PSI	Pounds per square inch
ft	Feet	RM	Relative motion
FTC	Fast Time Constant	RTE	Route
gal	Gallons	ROT	Rate of turn
GPS	Global Positioning System	s	seconds
HBR	Automatic harbor mode	SHM	Ships Heading Marker
HDFI	High Definition Fish Imaging	sm	Statute Miles
HDG	Heading	SOG	Speed Over Ground
H-Up	Head up orientation	SRM	Safety Related Message
KHz	Kilohertz	STDBY	Standby

STN	Channel
TCPA	Time to Closest Point of
TM	True motion
TTG	Time To Go
TVG	Time Variable Gain
TX	Transmit
UTC	Universal Time Constant
VMG	Velocity Made Good
VRM	Variable Range Marker
WPT/	Waypoint/Waypoints
XTE	Cross Track Error

Appendix B: List of cursor labels

Label	Feature	Application
A/B	Ruler line	Chart
AIS	AIS target	Chart
COG	Course Over Ground vector	Chart
CTR	centre of radar	Radar
FLT	Floating EBL/VRM	Radar
GRD	Guard zone	Radar
HDG	Heading vector	Chart
MARPA	MARPA target	Radar
MOB	Man Over Board marker	Chart and radar
POS	Vessel's position	Chart
RTE	Route leg	Chart
SHM	Ship's Heading Marker	Radar
TIDE	Tide indicator	Chart
VRM/EBL	VRM and EBL, 1 or 2	Radar
WIND	Wind indicator	Chart
WPT	Waypoint	Chart and radar

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